MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2016/2017

PMT0101 – MATHEMATICS I

(All sections / Groups)

17 OCTOBER 2016
2.30 p.m. – 4.30 p.m.
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of **THREE (3)** printed pages including the cover page with 4 questions only.
2. Answer all **FOUR (4)** questions
3. Write all your answers in the answer booklet provided.
4. Only NON-PROGRAMMABLE calculators are allowed.

Question 1 (25 Marks)

a) Perform the indicated operation and simplify the expression as a single quotient with positive exponents.

$$\frac{1-\dfrac{x}{x+1}}{2-\dfrac{x-1}{x}}$$ **(6 marks)**

b) Solve each expression and write in the standard form $a + bi$.

i. $3(4+i) - 4(-2-5i)$ **(3 marks)**

ii. $\dfrac{3+4i}{2-5i}$ **(6 marks)**

c) Reduce the following rational expression to the lowest term

$$\frac{x^2+5x-14}{2-x}$$ **(5 marks)**

d) Simplify and express in terms of positive integer exponents.

$$\left(\frac{2x^{1/3}y^{2/3}}{3x^{1/6}y^{-3}}\right)^{-3}$$ **(5 marks)**

Question 2 (25 Marks)

a) Find the real solutions.

i. $(x-1)(2x+3) = 3$ **(5 marks)**

ii. $|2-3x| + 2 = 9$ **(5 marks)**

iii. $|3x+4| < \dfrac{1}{2}$ **(5 marks)**

b) Solve the following equation by using the given method.

i. $2x^2 + 5x + 3 = 0$ quadratic formula **(5 marks)**

ii. $x^2 - 6x - 13 = 0$ completing the square **(5 marks)**

Continued...

Question 3 (25 Marks)

a) Given $f(x) = x + 1$ and $g(x) = x^2 + 4$. Find

i. $(f \circ g)(x)$ **(3 marks)**

ii. $(g \circ f)(x)$ **(3 marks)**

b) Find the inverse of the following function.

i. $f(x) = \dfrac{3x}{x+2}$ **(5 marks)**

ii. $f(x) = \dfrac{-3x-4}{x-2}$ **(5 marks)**

c) Factorize the expression by grouping

$$x^3 - 4x^2 + 3x - 12$$ **(3 marks)**

d) Graph the function below using the techniques of transformations. Start with the graph of the basic function and show all the stages.

$$f(x) = (x-1)^2 + 2$$ **(6 marks)**

Question 4 (25 Marks)

a) Find the sum of the sequence

$$6, 12, 18, \ldots, 756$$ **(8 marks)**

b) Find an equation of the line with the given properties.

i. Containing the points $(5, -2)$ and $(4, 1)$. **(4 marks)**

ii. Parallel to the line $2x + y = -7$, containing the point $(2, -3)$. **(4 marks)**

iii. Perpendicular to the line $2x + y = 5$, containing the point $\left(\frac{1}{2}, -5\right)$. **(4 marks)**

c) A, B and M are three points such that M is a midpoint of AB. The coordinates of A and M are $(-6, -3)$ and $(-9, 1)$, respectively. Find the coordinates of B. **(5 marks)**

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